

REMARKS

The present invention concerns a magnetically passive position sensor which utilizes a plurality of magnetically moveable electrical contact spring elements and an adjoining thick film mesh to create a closed circuit and develop a signal that is indicative of fuel level within an automobile fuel tank. The position sensor utilizes an elongate magnet which is held in fixed position at the end of a pivoting arm that is carried on a float operated rotating axis. While the magnet has a physical or mechanical axis that extends through the magnet along the center line thereof, the present applicant found that the magnet also had a magnetic axis and that this axis deviates from the mechanical axis, that is, it is not aligned with the physical axis. Unfortunately, this angular deviation between mechanical and magnetic axes was responsible for spurious indications of the level of fuel contained in a tank, particularly at the extreme locations of the electrical contact spring elements. Thus, the present invention overcame the problems associated with the inaccurate results that occurred due to the deviation in the direction of the magnetic axis from the mechanical axis of the operating magnet. In the present invention, the position of the magnetic axis is identified and the magnet is then held non-rotatably at the end of a float operated pivot arm in a position such that there is no angle of deviation between the mechanical and the magnetic axes, when viewed from above. Both of the axes are contained in an imaginary plane that would extend vertically through the magnetic body so that when viewed from above one axis lies on top of the other. By having the two axes positioned in this fashion, the magnetic axis always points to the same contact spring element as the mechanical axis and assures improved movement of the spring elements throughout the entire range of the spring elements.

Claims 1 through 4 stand rejected under 35 U.S.C. 102(b) as anticipated by Wallrafen, U.S. Patent No. 6,070,337. The Wallrafen patent is well known to applicant since that inventor is an employee of the same company to which the present application is assigned. The apparatus of this patent was referred to, within the inventor's company, as the MAPPS (Magnetically Activated Passive Position Sensor Program). The problem that was found in conjunction with use of a Wallrafen apparatus was detected only after the MAPPS was in commercial production. While the Wallrafen apparatus is similar to the apparatus of the present application, Wallrafen only held the operating magnet 11 in a fixed position on the end of pivot arm 14 but the magnetic axis is not identified by Wallrafen. The present application, for the first time, identifies the

problem of the offset or deviation between the mechanical and magnetic axes and that the problems arising from use of the Wallrafen apparatus can be eliminated by orienting the magnet in the manner described in the specification.


Claim 1 has now been amended to more clearly recite that the magnet carried on the pivot arm is held in a fixed position at the end of the pivot arm in a position where one axis overlies the other, when viewed from above. Claim 4 has also been amended in a similar fashion to state that the method involved includes the steps of determining the location of the magnetic axis and then placing the magnet in a properly oriented position at the end of the pivot arm where it can direct the magnetic field in an improved fashion to effect movement of the contact spring elements.

In view of the amendments to the claims and for the reasons set forth above, it is submitted that the claims clearly distinguish over the Wallrafen reference and that they are, therefore, in allowable condition. Accordingly, reconsideration and allowance are respectfully requested.

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Respectfully submitted,



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